

IN THE CLAIMS:

1. (Currently Amended) A medical instrument holding apparatus comprising:
a supporting mechanism which has a distal end portion supporting ~~supports~~ a
medical instrument and a holding portion being held by the operator;

a moving mechanism which has first and second sides and which supports the
supporting mechanism;[[,]] ~~and~~

a shaft portion located between the first and second sides and ~~which supports the~~
~~supporting mechanism;~~ allowing the medical instrument and the supporting mechanism to be
~~moved around~~ rotated about the shaft portion;

a basal portion which is coupled to the shaft portion, the basal portion supporting
~~and which supports~~ the moving mechanism[[,]] and allowing the moving mechanism to rotate
~~around~~ about the shaft portion;

a ball joint which couples the moving mechanism and the supporting mechanism
and which is provided in a position shifted from a center of gravity of the holding portion on the
supporting mechanism toward the moving mechanism, the ball joint further supporting the
supporting mechanism to be pivotable with respect to the moving mechanism; and

a counterweight which is located on the second side of the moving mechanism
such that ~~and generates~~ a first rotation moment ~~being~~ is smaller than a second rotation moment
generated from the weights of the medical instrument and the supporting mechanism, the
counterweight ~~and~~ acting ~~around~~ about the shaft portion in the opposite direction to the second
rotation moment.

2. (Original) A medical instrument holding apparatus according to claim 1,

wherein the moving mechanism and the supporting mechanism have braking mechanisms capable of being switched between a restrictive state in which the moving and supporting mechanisms are prevented from moving and a permissive state in which the mechanisms are allowed to move, and the supporting mechanism has a switch which is operated by an operator and switches the braking mechanisms to switch the moving and supporting mechanisms between the restrictive state and the permissive state.

3. (Currently Amended) A medical instrument holding apparatus according to claim 2, wherein ~~the supporting mechanism includes: a holding portion which supports the medical instrument and is held by the operator;~~ the holding portion ~~being~~ is located so that the center of gravity of the combination of the holding portion and the medical instrument and the center of operation by the operator are situated in different positions on the holding portion; ~~a support arm having one end and the other end, the one end being supported on the moving mechanism; and a joint which is supported on the other end of the support arm and supports the holding portion so as to be inclinable with respect to the support arm;~~ the center of inclination of the ball joint around which the holding portion is inclined by means of the ball joint being situated in a position different from the center of gravity of the center of gravity of the combination of the holding portion and the medical instrument; and

the supporting mechanism further includes a support arm having one end and the other end, the one end being supported on the moving mechanism.

4. (Original) A medical instrument holding apparatus according to claim 3, wherein the moving mechanism has a parallelogrammatic link mechanism, the link mechanism including: a first arm having one end connected to the support arm; a second arm having one end

rotatably connected to the one end of the first arm, the second arm being provided with the shaft portion which is located between the one and the other ends of the second arm and supports the whole moving mechanism for rotating motion; a third arm kept parallel to the second arm and having one end connected to the other end of the first arm; and a fourth arm having one end connected to the other end of the second arm and connected to the third arm so as to be parallel to the first arm, the counterweight being located on the other end of the fourth arm.

5. (Original) A medical instrument holding apparatus according to claim 4, wherein the first arm is shorter than the fourth and second arms.

6. (Original) A medical instrument holding apparatus according to claim 5, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

7. (Currently Amended) A medical instrument holding apparatus according to claim 6, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

8. (Original) A medical instrument holding apparatus according to claim 4,

wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

9. (Currently Amended) A medical instrument holding apparatus according to claim 8, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

10. (Original) A medical instrument holding apparatus according to claim 2, wherein the moving mechanism has a parallelogrammatic link mechanism, the link mechanism including: a first arm supported on the supporting mechanism; a second arm having one end rotatably connected to one end of the first arm, the second arm being provided with the shaft portion which is located between the one and the other ends of the second arm and supports the whole moving mechanism for rotating motion; a third arm kept parallel to the second arm and having one end connected to the other end of the first arm; and a fourth arm having one end connected to the other end of the second arm and connected to the third arm so as to be parallel to the first arm, the fourth arm having the counterweight on the other end thereof.

11. (Original) A medical instrument holding apparatus according to claim 10, wherein the first arm is shorter than the fourth and second arms.

12. (Original) A medical instrument holding apparatus according to claim 11, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

13. (Currently Amended) A medical instrument holding apparatus according to claim 12, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

14. (Original) A medical instrument holding apparatus according to claim 10, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

15. (Currently Amended) A medical instrument holding apparatus according to claim 14, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of

gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

16. (Currently Amended) A medical instrument holding apparatus according to claim 1, wherein ~~the supporting mechanism includes: a holding portion which supports the medical instrument and is held by the operator,~~ the holding portion ~~being~~ is located so that the center of gravity of the combination of the holding portion and the medical instrument and the center of operation by the operator are situated in different positions; ~~a joint which supports the holding portion so as to be inclinable,~~ the center of inclination of the ball joint around which the holding portion is inclined by means of the ball joint being situated in a position different from the center of gravity of a heavy structure including the holding portion and the medical instrument; and

the supporting mechanism further includes a support arm having one end and the other end, the one end being supported on the moving mechanism and the other end supporting the ball joint.

17. (Original) A medical instrument holding apparatus according to claim 16, wherein the moving mechanism has a parallelogrammatic link mechanism, the link mechanism including: a first arm having one end connected to the support arm; a second arm having one end rotatably connected to the one end of the first arm, the second arm being provided with the shaft portion which is located between the one and the other ends of the second arm and supports the whole moving mechanism for rotating motion; a third arm kept parallel to the second arm and having one end connected to the other end of the first arm; and a fourth arm having one end connected to the other end of the second arm and connected to the third arm so as to be parallel

to the first arm, the counterweight being located on the other end of the fourth arm.

18. (Original) A medical instrument holding apparatus according to claim 17, wherein the first arm is shorter than the fourth and second arms.

19. (Original) A medical instrument holding apparatus according to claim 18, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

20. (Currently Amended) A medical instrument holding apparatus according to claim 19, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

21. (Original) A medical instrument holding apparatus according to claim 17, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

22. (Currently Amended) A medical instrument holding apparatus according to claim 21, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism

includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

23. (Original) A medical instrument holding apparatus according to claim 1, wherein the moving mechanism has a parallelogrammatic link mechanism, the link mechanism including: a first arm supported on the supporting mechanism; a second arm having one end rotatably connected to one end of the first arm, the second arm being provided with the shaft portion, which is located between the one and the other ends of the second arm and supports the whole moving mechanism for rotating motion, and coupled to the basal portion by means of the shaft portion; a third arm kept parallel to the second arm and having one end connected to the other end of the first arm; and a fourth arm having one end connected to the other end of the second arm and connected to the third arm so as to be parallel to the first arm, the fourth arm having the counterweight on the other end thereof.

24. (Original) A medical instrument holding apparatus according to claim 23, wherein the first arm is shorter than the fourth and second arms.

25. (Original) A medical instrument holding apparatus according to claim 24, wherein the counterweight has an adjusting mechanism which adjusts the position of the center of gravity of the counterweight along the axis of the fourth arm.

26. (Currently Amended) A medical instrument holding apparatus according to claim 25, wherein the ball joint includes a detecting mechanism which detects the angle of inclination of the holding portion to the moving mechanism, and the adjusting mechanism includes an arithmetic mechanism which calculates the variation of the rotation moment around the shaft portion, based on the angle of inclination of the holding portion detected by means of the detecting mechanism, and a barycenter position adjusting mechanism which moves the counterweight along the axis of the fourth arm, thereby adjusting the position of the center of gravity of the counterweight, in accordance with the result of computation by the arithmetic mechanism.

27. (Currently Amended) A medical instrument holding apparatus comprising:
a basal portion having one end portion and an other end portion, the one end portion being fixed and having a shaft portion on the other end portion ~~thereof~~;
a rotating member having one end portion and ~~the~~ an other end portion, the shaft portion being located ~~[[by]]~~ between the one and the other end portions of the rotating member;
a supporting mechanism which is located on the one end portion of the rotating member and has a distal end portion supporting ~~supports~~ a medical instrument and a holding portion being held by the operator;
a ball joint which couples the moving mechanism and the supporting mechanism and which is provided in a position shifted from a center of gravity of the holding portion on the supporting mechanism toward the moving mechanism, the ball joint further supporting the supporting mechanism to be pivotable with respect to the moving mechanism; and
a counterweight which is located on the other end portion of the rotating member

~~and~~ such that the counterweight generates a rotation moment lower than and opposite to a rotation moment around the shaft portion caused by the sum of the respective weights of the medical instrument and the supporting mechanism.

28. (Currently Amended) A medical instrument holding apparatus according to claim 27, wherein ~~the supporting mechanism includes: a holding portion which supports the medical instrument and is held by the operator;~~ the holding portion is being located so that the center of gravity of the combination of the holding portion and the medical instrument and the center of operation by the operator are situated in different positions; ~~a joint which supports the holding portion so as to be inclinable;~~ the center of inclination of the ball joint around which the holding portion is inclined by means of the ball joint being situated in a position different from the center of gravity of the combination of the holding portion and the medical instrument; and the supporting mechanism further includes a support arm having one end and the other end, the one end being supported on the moving mechanism and the other end supporting the ball joint.

29. (Original) A medical instrument holding apparatus according to claim 28, wherein the rotating member has a parallelogrammatic link mechanism, the link mechanism including: a first arm having one end connected to the one end of the support arm; a second arm having one end rotatably connected to the one end of the first arm, the second arm being provided with the shaft portion which is located between the one and the other ends of the second arm and supports the whole rotating member for rotating motion; a third arm kept parallel to the second arm and having one end connected to the other end of the first arm; and a fourth arm having one end connected to the other end of the second arm and connected to the third arm so as

to be parallel to the first arm, the fourth arm having the counterweight located on the other end of therefore.

30. (Currently Amended) A medical instrument holding apparatus comprising:
supporting means which has a distal end portion supporting ~~supports~~ a medical instrument and a holding means being held by the operator;

moving means which supports the supporting means, the moving means having one side and an other side and allowing the supporting means to move at the one side thereof; ~~[[,]] the moving means having~~

a shaft portion ~~and~~ operatively connected to the moving means for rotating the supporting means ~~around the shaft portion~~, thereby moving the ~~medical instrument~~ medical instrument;

a basal portion which is coupled to the shaft portion and supports the moving means, allowing the moving means to rotate around the shaft portion;

a ball joint which couples the moving means and the supporting means and which is provided in a position shifted from a center of gravity of the holding means on the supporting means toward the moving means and supports, the ball joint further supporting the supporting means to be pivotable with respect to the moving means; and

a counterweight which is located on the other side of the moving means ~~and~~ such that the counterweight generates a rotation moment smaller than and opposite to a rotation moment around the shaft portion caused by the respective weights of the medical instrument and the supporting means.

31. (Currently Amended) A ~~medical instrument~~ medical instrument holding

apparatus according to claim 30, wherein ~~the supporting means includes: holding means which supports the medical instrument and is held by the operator,~~ the holding means ~~being~~ is located so that the center of gravity of the combination of the holding means and the medical instrument and the center of operation by the operator are situated in different positions on the holding means; and

the supporting means further includes a tilting mechanism which supports the holding means so as to be inclinable, the center of inclination of the tilting mechanism around which the holding means is inclined by means of the tilting mechanism being situated in a position different from the center of gravity of the combination of the holding means and the ~~medical instrument~~ medical instrument; and a support arm having one end and the other end, the one end being supported on the moving means and the other end supporting the tilting mechanism.

32. (New) A medical instrument holding apparatus according to claim 1, wherein the ball joint includes a braking mechanism which is configured to switch between a state of restriction to regulate a movement of the moving mechanism and the supporting mechanism and a state of permission to permit the movement; and

the holding portion includes a switch which is configured to switch the braking mechanism between the state of restriction and the state of permission.

33. (New) A medical instrument holding apparatus according to claim 1, wherein the medical instrument includes an optical system which observes an object.

34. (New) A medical instrument holding apparatus according to claim 33, wherein the optical system includes an imaging system.